2022/08

BACHELOR OF COMPUTER APPLICATION
SECOND SEMESTER (SPECIAL REPEAT)
DATA STRUCTURE THROUGH C
BCA-201

(Use Separate Answer Scripts for Objective & Descriptive)

Duration: 3 hrs. **Full Marks: 70**

[PART-A: Objective]

Time: 20 min. **Marks: 20**

Choose the correct answer from the following: ***1×20=20***

1. In a Stack, if a user tries to remove an element from empty stack, it is called ____
   a. Underflow
   b. Empty Collection
   c. Overflow
   d. Garbage Collection

2. Pushing an element into stack already having five elements and stack size of 5, then stack becomes ____
   a. Overflow
   b. Crash
   c. Underflow
   d. Userflow

3. The postfix from of the expression (A+B)*(C*D-E)*F/G is
   a. AB+CD*E-FG/**
   b. AB+CD*E-F**G/
   c. AB+CD*E-*F*G/
   d. None of the above

4. The result of evaluating the postfix expression 5,4,6,+,*,4,9,3,/,+,* is
   a. 600
   b. 350
   c. 650
   d. None of the above

5. Consider the following operation performed on a stack of size 5
   Push(1);
   Pop();
   Push(2);
   Push(3);
   Pop();
   Push(4);
   Pop();
   Pop();
   Push(5);
   After the completion of all operation, the number of elements present in stack are
   a. 1
   b. 2
   c. 3
   d. 4

6. A linear list of elements in which deletion can be done from one end(front) and insertion can take place only at the other end(rear) is known as a ?
   a. Queue
   b. Stack
   c. Tree
   d. Linked list

7. If the element "A","B","C" and "D" are placed in a queue and are deleted one at a time in which order they be removed?
   a. ABCD
   b. DCBA
   c. DCAB
   d. ABDC

8. Which of the following is not the type of queue?
   a. Ordinary queue
   b. Single ended queue
   c. Circular queue
   d. Priority queue

9. Consider the following definition in C language

```
struct node
{
    int data;
    struct node *next;
}
typedef struct node NODE;
NODE *pt;
```

Which of the following C code is used to create new node?
   a. ptr=(NODE *)malloc(sizeof(NODE));
   b. ptr=(NODE *)malloc(NODE);
   c. ptr=(NODE *)malloc(NODE *);
   d. None of the above

10. In a circular queue, how do we increment the rear end of the queue?
   a. rear ++
   b. (rear+1)%MAX_SIZE
   c. (rear % MAX_SIZE)+1
   d. None of the above

11. What is a dequeue?
   a. A queue with insert/delete defined for both front and rear ends of the queue
   b. A queue implemented with a doubly linked list
   c. A queue implemented with both singly and doubly linked lists
   d. None of the above

12. Binary trees can have how many children?
   a. 2
   b. Any number of children
   c. 0 or 1 or 2
   d. 0 or 1

13. Which of the following is false about a Binary Search Tree?
   a. The left child is always lesser than its parent
   b. The right child is always greater than its parent
   c. The left and right sub-tree should also be in BST
   d. None of the above

14. A graph having an edge from each vertex to every other vertex is called a _____
   a. Tightly connected
   b. Weakly connected
   c. Loosely connected
   d. None of the above

15. A pivot element to partition unsorted list is used in
   a. Merge sort
   b. Quick sort
   c. Insertion sort
   d. Selection sort

16. Which of the following searching techniques require the data to be in sorted form
    a. Binary search
    b. Linear search
    c. All of the above
    d. None of the above

17. How many swaps are required to sort the given array using bubble sort:{2,5,1,3,4}
    a. 5
    b. 4
    c. 6
    d. 7

18. Which of the following is non-linear data structure?
    a. Stacks
    b. List
    c. Strings
    d. Trees

19. In the ____ traversal we process all of a vertex's descendents before we move to an adjacent vertex,
    a. Depth First
    b. Breadth First
    c. With First
    d. Depth Limited

20. Visiting root node after visiting left and right sub-tree is called
    a. In-order traversal
    b. Pre-order traversal
    c. Post-order traversal
    d. None of the above

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PART-B : Descriptive

Time : 2 hrs. 40 min. **Marks : 50**

[Answer question no.1 & any four (4) from the rest]

1. Explain the different types of queues. Discuss the Delete operation for a normal queue. 7+3=10

2. Explain tree traversal technique with example. Define Binary tree, Strictly Binary tree, Complete Binary tree and Binary Search tree. 6+4=10

3. What are the basic searching technique? Write a C program to search for an item using Binary Search? 4+6 =10

4. What is Depth First and Breadth First traversal? Explain Kruskal's algorithm to find minimum spanning tree with suitable examples. 4+6=10

5. Convert the following expression to postfix expression using stack 10

   A-B+(M^N)*(O+P)-Q/R^S*T+Z

6. **a.** Write the function to insert an item in the particular position in singly linked list? 5+5 =10

   b. What is doubly linked list and Circular linked list?

7. Explain Selection sort with proper example and program. 5+5=10

8. Convert the following infix expression to postfix 5+5 =10

   a. a-b/(c+d*e)

   b. ((a+b)*c-(d-e))/(f+g)

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